

MEMORANDUM FOR RECORD

Subject: Summary of comments received on the Automated Configuration Management System (ACMS) Task Force Plan of Action

1. I have received comments from the following people:

Person	Organization	Summary of Comment
Tom Mazza	STRICOM	Functionality must reflect the needs of the ever changing IPPM environment and should not be tied to what exists now.
Mike Cantrell	CBDCOM	System must evolve from today's detailed document oriented system to the future process described by STRICOM.
Dennis Helstrom	ACALA	System needs to evolve. Need to address who is responsible for the maintaining the data.
James Rickenbaugh	ATCOM	Concurs with plan. Thinks STRICOM makes some good points.
Ron Kerbo	MICOM	In general agreement with the plan. Need to look beyond 2549.
Gayle Booker	PM EDMS	Generally agrees with the plan. Must look beyond 2549. CM functionality must be defined in context with overall lifecycle of tech data.
Caroll Sitroon	TACOM-ARDEC	Generally agrees with the plan. Develop Performance Spec rather than System Spec. Should think in terms of reinventing soe of the regulations rather than being limited by them.

2. All of the comments show positive support for the plan of action. Many of the comments concern what that individual believes the CM requirements should be or how the task force should function. All are good comments whose resolution should to be left to the Task Force. The comments offered thus far have in essence initiated the dialogue that must take place if we hope to reach an Army consensus.
3. The specific comments are attached.

Gordon Ney
Chairman, Engineering Data Management Systems
Functional Coordinating Group

Comments on the POA for an Automated CM System

In the IPT/IPPM world, management of change becomes increasingly important and the principles of configuration management do not change, but their application is radically different. What I am reading here is more along the lines of classical CM. I may be wrong, but it looks like this POA is trying to solve a problem from the 1970-1980 timeframe, not what we need for the future. It is necessary to establish a new framework for changes that underlies the implementation of IPPM. CM as written here appears to be geared towards controlling the paperwork associated with drawings, specs, etc. and maybe even product definition data. IPPM must include process description that take place outside the design world and in the contractors plants. In a IPPM environment interdependencies arise from interactions of a multidisciplinary team which require new levels of product and process integration to build and support a product. Therefore, many more relationships must be maintained within the product knowledge base. The use of electronic mock-up and process simulation techniques during the design integration and verification phase will enhance the ability of a command to manage the new complexity and compress the design iteration cycles.

Change in a IPPM environment involves many competing second-order effects because IPPM strives to optimize the total design by treating all design issues simultaneously. The configuration management system must handle this increase in complexity. Another important part of managing a IPPM product development project is managing the sequence of significant events. When significant events occur, they are communicated to the relevant team members, who in turn react as appropriate, propagating further changes. Thus the IPPM environment, including the information architecture and the IPPM team members, may be viewed as a large-state machine. The information architecture, therefore, should allow for constant changes in the state of the system (the product design and the environment) but only in well-defined ways. The information architecture should provide a mechanism for users to define the CM methodology which restricts the way changes are made and the events that are triggered. To meet these goals, several principal capabilities of the information architecture must be present. What I am trying to describe below is the Tom Mazza version of the “to-be” state for CM.

1. System Level Support - It is essential that system-level support, i.e., support to all team members at all levels of product and organization hierarchy, be available for configuration management. During product development, changes to its design are likely to occur and have a cascading effect across the IPPM team. The information architecture must permit capture of change information and notify affected team members.

2. Product Structure Configuration - As the design evolves the information architecture should maintain the configuration of product structure. The objective is to allow creation and maintenance of a configuration definition, e.g. SOW, SPEC, WBS, bill of materials, drawings, Electronic mock-ups, which relates product data, process data, and associated tasks with resources. Through this, a configuration baseline is established and maintained. Specific versions of design objects comprise a configuration. Thus, collections of objects can be organized into meaningful and manageable subsets. Configurations can be built from other configurations. Modularization and reusability of design components can be facilitated.

3. Change Control - Change control or version management is the ability to create and manage evolving representations of engineering information [THIS IS ALL I READ INTO THE CURRENT WORDING]. In a IPPM environment engineering information is developed incrementally throughout the design process. Many alternative designs or design trade-offs may be explored before the “best” design is arrived at. Alternatively, to stay current, products and processes must be constantly enhanced, improved, and evolved. The information architecture should support these methodologies by enabling users and/or tools to create and manage incremental representations of product and process designs while providing sufficient control to restrict unauthorized changes. In addition to supporting the development of the optimal design, change control also allows a design evolution to be tracked for monitoring the design process. To support these objectives, some of the capabilities required of the information architecture are the ability to define the change review process, version control, information inheritance, and version branch and merge.

4. Design Release Management - In a IPPM environment, design release is characterized by a continuous/incremental release. Product definition data will be made available (released) to the team members at many more stages in the design cycle than in the old traditional sequential release methods. Also, there may be a need to make product definition available to a subset of the total community at certain stages of the process. The information architecture should support configurable data fields, checkpointing and multiple release levels. The formal release of a product design component signals to project management the completion of a milestone; they will then initiate further action from a program

point of view. The team members must be able to assess the impact of change requests using “what if” simulation technology, and to expedite their implementation.

5. Event Management (Tracking/Notification) - The information architecture should provide an adaptive event manager capable of interpreting the significant events occurring during the design process. This is the means by which design activity is synchronized over time and resources. The most difficult tasks in project management are to obtain up-to-date task progress information and to have project participants provide accurate and timely notification of design, engineering, logistics, manufacturing or other “ilities” progress and changes. Successful task coordination and data management requires a flexible user interface that will allow a member of the multifunctional IPPM team to report task and design information to appropriate personnel.

The event tracking and notification system should be structured to automatically transmit information to selected groups of team members who will benefit from it. An event notification network based on team role types, and the notification data needs of each role type, will be required. The network must provide opportunities for direct access among some users, and limited access among others. The network must also provide selective event notification for at least three levels (“selective” in the sense that some users will want to communicate tentative design changes without broadcasting their suggestions to the whole team).

a. Users operating in the same domain, who have the same job definition (role type) or data needs will find it necessary to communicate continually, but in a semi-private, somewhat closed environment; thus a local event notification capability should be present.

b. An intra-task communication capability, which will serve as the reviewer link and the task managers’ communication tool, will be needed.

c. Highest level of event notification and tracking should be provided through an open access, all-encompassing link that has been partitioned into technical, management, or general data streams.

Access rules and constraints for the entire communication network need to be established and maintained.

6. Exception Handling - In a IPPM environment, the information architecture should provide an adaptive, distributed exception handling system that permits, if at all possible, rollback to some stable state of the design.

7. Information Integrity Management - A set of domain-independent services are required which relate to information integrity.

a. Security/Access Control - Security is important within the IPPM framework because an information architecture user cannot be isolated from the rest of the team members. Team members may have access to some levels and be isolated from others, but need to be connected to the system constantly in a IPPM environment. Therefore, many levels of access classification will be required.

b. Archiving and Retrieving Data - In a IPPM framework, data must be available within the system architecture. Complex relationships within the information in the system require the ability to archive and retrieve data easily.

c. Referential and Structural Integrity - Product definition data with all of its relationships is constantly changing and growing. Most of these relationships are indirectly linked. Changing something (a link) in the middle of one or several indirect relationships should not destroy those relationships.

d. Concurrency Control - Transactions are different in the IPPM environment. They may vary in length and involve much bigger chunks of information. Product data must be managed so the team members get what they think they are getting. Engineering transactions involve updates to configurations which are likely to be made up of large amounts of distributed data rather than individual record fields as in a traditional database system. An on-going transaction requires controlled sharing of information by multiple users in an update mode. (Traditional database transactions, on the contrary, impose a logical serial order on updates to the database.) Error recovery, backup and archival services must be integral to the concurrence control mechanism to properly support IPPM.

The stated Objective to start with TD/CMS-E and expand it to meet MIL-STD-2549 is solving the wrong problem. Throw TD/CMS and 2549 in the trash. They still represent the way we were doing business prior to IPPM.

Tom Mazza

Subject: RE: Plan of Action for CM Automation Task Force

My comments are as follows:

I both agree and disagree with Tom Mazza's comments. I disagree to the extent that I do not believe our historically detail design based engineering document system is going to disappear to be replaced with a performance specification based system. I know of several system that have been exempt from the performance specification mandate and there will be systems in the field for decades that will required repair parts procured with detail engineering designs. In all other aspects, I agree with Tom's comments. TDCMS is at least five years behind where we need it to be today, and that is an integrated data base containing both TDCMS type status accounting and tracking data linked to (and controlling) the actual native intelligent data (CADDs, AUTOCAD, Interleaf, etc.) which in turn is linked to an easily viewable version (CALS Type 1, PDF, etc.) for those user not needing or being able to use the native intelligent data. Because of the current system deficiencies, CBDCOM has been working for the past two years to replace TDCMS. We have chosen a COTS product which is being installed current and which we expect to open to all of our users within a matter of weeks. Included in this product is a workflow system with which we plan to automate all of our engineering data processes. The COTS we are using is the Workgroup Technology CMS product and if the Army want to decide on a standard COTS to use, we would like this product to be considered. If the FCG wants to enter into some kind of agreement with Workgroup to evaluate the Workgroup product, CBDCOM will volunteer to be the test bed. In all honesty, I think there are tens of COTS products that will do the job and I see the Army's selection and acquisition of a standard system taking years. At the working level, we don't have time to wait for an standard system to be made available. We have already lost a large number of personnel and will be losing more. We have to use the currently available technology to increase our productivity now or we will not be able to perform our mission. Rather than developing a standard system, I would recommend development of interface standards for what data is to be exchanged between Army sites and the commercial sector and let each Army site develop or buy whatever it needs to meet those interface standards as well as provide for the solution of any local problems. I think this better fits in with the current empowerment philosophy.

Mike Cantrell

Subject: Re[2]: Plan of Action for CM Automation Task Force

Tom -- Very good comments. But we have to live in the real world where evolution, change and information are paramount. What I did not see addressed is CM's problem of who is responsible for the data, who makes changes, who validates, who input to the computer. Throwing out what we have is not the answer. We need to evolve what we have. For example the drawing had a lot of this data , signature of submitting Eng., date of last change, tie in to ECP, etc. I see the biggest problem in CM as maintaining the Configuration Control in the field along with field densities. Our MWO process, Total Asset Visibility (TAV), maintenance, and battle damage repairs are all part of CM. Not just on the manufacturing and production end.

Dennis Helstrom

ACALA

Subject: Fwd: Plan of Action for CM Automation Task Force

Gordon: What goes around comes around. Seems we have done something similar to this before. Concur with your proposal. However, should consider some of STRICOM's input. 2549 the last I saw, does kind of address historic CM with a few twists and has many deficiencies in fielded systems configurations. 2549 only defines data element relationships and not system requirements.

As another heads up, make sure you obtain contractors CM qualifications in response to RFP. We don't need dinosaurs. In one of my latest efforts I had to define CM to the contractor and all I got back was my words in the final product.

RICKENBAUGH

Gordon,

Comments on the POA are in the attached file. You will find us in general agreement with the plan. Our only areas of possible concern are the identification of functional requirements and the consideration of existing software. These sort of go hand in hand and are pretty well laid out in our comments. We sort of assumed that these issues would be addressed concurrently with the development of the system spec but the POA doesn't specifically address that.

There is a good deal of legwork involved in assessing functional requirements but we can likely limit the inflation factor of initial requirements by looking at what people have already done. If they haven't built a functionality yet it may not be a critical requirement. Maybe these type "requirements" should be put into the first wave of SW upgrades after fielding rather than a "pie in the sky" system spec. Sort of a phased approach to fielding.

Let me know if you have any questions. John is on leave this week and Carla will be at ATCOM for the balance of the week.

Thanks,

Ron Kerbo

Task Force Objectives:

- Reach Army consensus for Army Configuration Management functionality that begins with Technical Data / Configuration Management System - Enhanced (TD/CMS-E) functionality and expands it to meet the requirements of MIL-STD-2549 as a minimum. Does MIL-STD-2549 adequately address all Army requirements? The last scrub of the document by the potential user community was over a year ago. Many of the decisions made at that scrub were driven by DSIC "direction" that may have changed, as may have some Army needs.
- Develop a test methodology that objectively evaluates the ability of a potential solution to meet the Army's needs.
- Minimize development costs and time by considering the use of COTS or existing Government software to satisfy Army needs.
- Recommend an acquisition strategy that will lead to a solution that has growth potential to meet Acquisition Reform Initiatives and evolving US and International configuration management standards.
- Recommend an acquisition strategy that will lead to a solution that will work within the current and projected Army technical data infrastructure.
- Maximize the use of on-going initiatives (e.g. - Testing of CMstat, JEDMICS Program Redirection, DoD MIL STD 2549 prove out, CECOM Intelligent Product Data Business Process Improvement, LAISO Integrated Data Environment, JCALS Pilot Programs, etc.). This list appears to be finite and includes only one initiative that is not from the DOD or Army level. We need to allow good ideas to bubble up in this process rather than making the JLSC mistake of thinking that all good ideas are forced down from the top. There are other initiatives that we know were looked at by the FAA that are not included in this list (CARS, ECP Tracker, MICAPP, MEARS). We need to recognize

that differences in commodities managed by the various Commands and the resulting tailored business processes may make it attractive to build in “excess” functionalities to support those business processes, especially if the functionalities already exist. MICOM and ATCOM are learning the hard way that everyone doesn’t do business the same way. If we (the Army) had been able to allocate resources to keep everyone with the same suite of tools, AMCOM standup would be considerably easier. No one should be forced to take a step backward in the name of progress. One thing that tended to hold up JLSC was trying to meet “gee whiz” requirements for people who had never had a true CM system to work with and wanted to adulterate the system. This continues to be a somewhat of a problem for JEDMICS and should be avoided if we are to recommend a truly standard system that can be developed in a reasonable amount of time.

Task Force Products:

- Mission Need Statement - The mission need statement will validate the need for ACMS. It will be based on a consensus determination by the AMC Engineering Data Management Systems (EDMS) Function Coordinating Group (FCG) and AMCRDA (the Business Process Manager for Engineering Data). It will describe current deficiencies, explain why additional automation is required, and define the boundary lines for the system (what it will cover versus what will be left to other systems, either existing or under development, existing systems). (See Attachment 1 for MNS outline)
- System Specification - Based on the results of an AMC-wide functional requirements analysis, the system specification will contain all system-level functional requirements for ACMS. It will also contain interface requirements between itself and all other automated technical data systems that it must work together with to create a seamless data management environment. Finally, it will also contain product verification criteria for determining product compliance with performance requirements. (See Attachment 2 for System Specification outline) How will the functional requirements analysis be performed? Do we plan to mail out a survey or will this be a travel-intensive effort? MICOM RDEC has seen the TACOM-ARDEC CARS system. It would be very difficult to explain in a survey exactly what it does, how it works, and more importantly how it supports their business processes. We need to find out what everyone has through a survey then have someone(s) go around and identify the critical functionalities in each system. Only then will we be able to fully analyze the functional requirements and develop a recommendation. Some of the functionality we find will likely fall to other systems like a workflow manager but we owe it to ourselves to make sure we capture all the requirements we can.
- Market Survey - The market survey will identify and list all non-developmental software (commercial and Government owned) that are available and appear to meet the general goals of ACMS.

- Market Analysis - The market analysis will compare the available software discovered during the market survey against the system specification performance requirements to discover which software (or combination of software) meets the requirements.
- Cost and Operational Effectiveness Analysis (COEA) - This analysis will compare the candidate software identified during the market analysis and alternative acquisition strategies for trade-offs between performance and cost. It will show various options ranked against MNS objectives
- Acquisition Strategy (AS) - Based on the results of the market analysis and COEA, the acquisition strategy will identify one or more software tools which meet or come closest to meeting the ACMS requirements. It will describe a strategy for testing those alternatives and downselecting to the “best value” system based on cost and performance considerations. A plan for ACMS system acquisition, fielding, attainment of operation capability, and ongoing maintenance will be presented along with associated costs and schedules. (See Attachment 3 for AS outline)

Task Force Membership:

The task force will be made up of the principle members of the Engineering Data Management Systems Functional Coordinating Group. Since the task force members have other jobs that they must perform, the task force will need support from an engineering support contractor(s) to effectively perform this task. Appropriate support can be obtained through existing contract instruments. The cost of this support is estimated at \$500k. The task force will be led by IEA and will report to DCSRDA. Task Force meetings will be held monthly, either in person or via VTC. In process reviews will be held at the completion of the MNS, System Specification, and the Acquisition Strategy and COEA. [If we are going to travel to identify requirements does this section need to include travel for government folks?](#)

DRAFT

1. This office agrees with the intent and with the Plan of Action for a Configuration Management System, however

there are some clarifications/expansions that need to be made.

2. The first is the Objective that states that the Army CM Functionality begins with the TD/CMS-E and expands

to include MIL-STD-2549 requirements. If this effort is truly to position the Army for CM in the 21st century, the mindset of the task force must be forward thinking. While TD/CMS has served the Army admirably for the last 30 years, it is, in fact, 30 years old, both in data structure and types of data supported. The new features that have been added over the years have been more of a mechanization effort rather than an automation effort. The true functional requirements must be defined (including analysis of MIL-STD-2549 as a base) and those requirements viewed in today's and tomorrow's automation environments.

3. The second issue is the part this automated CM system will play in the overall Technical Data picture. A CM system cannot be functionally defined (with interfaces) without a clear picture of its role in the overall life cycle of technical data. This must include the identification of data and types of data to be supported, the required interfaces (vs embedded functionality) and the owners of each type/group of data.

4. This office is mission responsible for the overall management control of the design, development, acquisition, testing and installation of an Army CM system. As such, we are most interested in this Task Force and its objectives. We will participate in and support the Task Force in anyway necessary to reach an acceptable Army solution.

draft as supplied by Gayle Booker

Here are my comments regarding the charts you submitted to our Office regarding the subject above:

You state in your charts that the Team was set up due to FAA recommendations to investigate the potential of the systems already available. However, you list on-going initiatives, but fail to list those already in place at TACOM-ARDEC, which were the basis for the FAA recommendation. Recommend that these be listed, i.e. Computer Aided Requirements System (CARS), Viewer as well as TDCMS and the "entire business process development" for Technical Data.

Systems Specification - recommend either in addition or to or in lieu of a System Spec, a performance specification be completed to address the necessary performance criteria which will enable most sites to be accommodated on a flexible basis in line with their own business processes.

When is the task force to be kicked off, i.e. I see a milestone chart, what is the anticipated date? What will the responsibilities be of the parties involved? Does each member get a "vote"?

Comment:

Not all of these systems are "configuration management" systems in the narrow sense. Recommend perhaps the term Material Management Systems since I am assuming these systems will replace the "canceled" JLSC sponsored systems.

Would also recommend that we look at "reinvention" terms and less at "authoritative source documents" as most of these documents are not bound in law but each site has their own book of guidelines, which may need to be combined and altered to ensure commonality among localities.

If you have any questions or comments on what I have stated, please do not hesitate to contact me.

Carol Sitroon